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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 09/872,360	§
Filed: May 31, 2001	§
Inventor(s):	§
Kan, et al.	§
	§

Examiner: Unknown
Group/Art Unit: 2171
Atty. Dkt. No: 5181-91401

Title: **DISTRIBUTED INFORMATION DISCOVERY**

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Robert C. Kowert
Name of Registered Representative

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Signature   January 8, 2004
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INFORMATION DISCLOSURE STATEMENT

JAN 1 3 2004

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Technology Center 2100

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Sir:

Applicant requests consideration of ☒ the references listed on the attached Form PTO-1449 and/or ☐ the additional information identified below in paragraph 3. A copy of each reference listed on the Form PTO-1449 is enclosed.

1. This Information Disclosure Statement is submitted:

a. ☐ within 3 months of the filing date of a national application other than a continued prosecution application under § 1.53(d);

☐ within 3 months of the date of entry of the national stage as set forth in § 1.491 in an International application;

☒ before the mailing date of a first Office Action on the merits; or

☐ before the mailing of a first Office Action after the filing of a request for continued examination under § 1.114.

b. ☐ after the events of above paragraph 1a and prior to the mailing date of a final Office Action or Notice of Allowance, and thus: ☐ the certification of paragraph 2 below is provided, or ☐ a fee of $180.00 is enclosed.

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c. ☐ after the mailing date f a final Office Action or a Notice of Allowance and prior to payment of the issue fee, and thus: the certification of paragraph 2 below is provided and a fee of $180.00 is enclosed.

2. It is hereby certified:

☐ that each item of information contained in this Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the Statement, or

☐ that no item of information contained in the Information Disclosure Statement was cited. in a communication from a foreign patent office in a counterpart foreign application or, to the knowledge of the person signing the certification after making reasonable inquiry, was known to any individual designated in § 1.56 (c) more than three months prior to the filing of the Statement.

3. ☒ Consideration of the following additional information (including any co-pending or abandoned U.S. applications, prior uses and/or sales, etc.) is requested:

U.S. Patent Application Serial No. 10/106,731 (5181-93100)
U.S. Patent Application Serial No. 10/106,600 (5181-93200)
U.S. Patent Application Serial No. 10/106,604 (5181-92900)
U.S. Patent Application Serial No. 10/106,601 (5181-93400)
U.S. Patent Application Serial No. 10/106,398 (5181-93000)

4. For each non-English language reference listed on the attached Form PTO-1449:

☐ reference is made to an English language translation submitted herewith, and/or

☐ reference is made to a foreign patent office search report (in the English language) submitted herewith, and/or

☐ reference is made to an English language translation of a foreign patent office search report submitted herewith, and/or

☐ reference is made to the concise explanation contained in the specification of the present application at page(s) _____, and/or

☐ reference is made to the concise explanation set forth below:

5. ☐ Applicant also offers the following comments for the Examiner's consideration:

6. ☐ Also enclosed is a copy of a foreign search report citing these references.

7. ☐ The listed documents were brought to the attention of the Applicant(s) after payment of the issue fee in the captioned case. The documents were cited in a communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of this Information Disclosure

Statement. Applicant(s) request this Information Disclosure Statement and attached Form PTO-1449 be placed in the file of the captioned application.

8. ☐ Applicant(s) requests that the Information Disclosure Statement and attached Form PTO-1449 and references, which are being filed before the grant of the patent and pursuant to 37 C.F.R. § 1.97(i), be placed in the file of the captioned application.

If any required fees are missing, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel, P.C. Deposit Account No. 50-1505/5181-91401/RCK.

Respectfully submitted,

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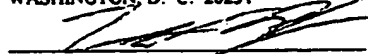
Form PTO-1449 (modified) List of Patents and Publications For Applicant's Information Disclosure Statement (Use several sheets if necessary)	ATTY. DKT. NO. 5181-91401 APPLICANT: Kan, et al. FILING DATE: May 31, 2001	SERIAL NO. 09/872,360 GROUP: 2171

U.S. PATENT DOCUMENTS

EXAM. INITIALS	REF. DES.	DOCUMENT NUMBER	DATE	NAME	CLASS	SUB CLASS	FILING DATE IF APPROPRIATE
	C1	6,161,102	12/12/00	Yanagihara, et al.			
	C2	6,070,158	5/30/200	Kirsch, et al.			

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FOREIGN PATENT DOCUMENTS

EXAM. INITIALS	REF. DES.	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUB CLASS	TRANSLATION YES/NO
	C3	829 811	3/18/98	EP			
	C4	00/62264	10/19/00	WO			

OTHER ART (Including Author, Title, Date, Pertinent Pages, Etc.)

EXAMINER: DATE CONSIDERED:

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the patent owner.

Information Disclosure Statement--PTO 1449 (modified)

System and Method for Multiple Data Sources To Plug into a Standardized Interface
for Distributed Deep Search

By

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Gene H. Kan
Thomas J. Camarda
David M. Doolin
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John Beatty

BACKGROUND OF THE INVENTION

1.   Field of the Invention

This invention relates to computer networks, and more particularly to a system and method for providing a distributed information discovery platform that enables discovery of information from distributed information providers.

2.   Description of the Related Art

It has been estimated that the amount of content contained in distributed information sources on the public web is over 550 billion documents. In comparison, leading Internet search engines may be capable of searching only about 600 million pages out of an estimated 1.2 billion "static pages." Due to the dynamic nature of Internet content, much of the content is unsearchable by conventional search means. In addition, the amount of content unsearchable by conventional means is growing rapidly with the increasing use of application servers and web enabled business systems.

Crawlers currently may take three months or more to crawl and index the web (Google numbers), so that conventional, crawler-based search engines such as Google may best perform when indexing static, slowly changing web pages such as home pages or corporate information pages. Targeted or restricted crawling of headline or other metadata is possible (such as that done by moreover.com) but this limits search ability. Web resources that do not have a "page of contents" or similar index—"deep" web resources—may be more difficult to search, index, or reference by conventional crawler-based search engines. For example, Amazon.com contains millions of product descriptions in its databases but does not have a set of pages listing all these descriptions. As a result, in order to crawl such a resource, it may be necessary—though difficult—to query the database repeatedly with every conceivable query term until all products are extracted. Likewise, many web pages are generated dynamically given information about ·

the consumer or context of the query (time, purchasing behavior, location, etc.), a crawler approach is likely to lead to distortion of such data. In some situations, content may be inaccessible due to access privileges (e.g. a subscription site), or for security reasons (e.g. a secure content site).

Conventional search mechanisms also may be less efficient than desirable in regard to some types of information providers, for example in regards to accessing dynamic content from a news site. A current news provider may provide content created by editors and stored in a database as XML or other presentation neutral form. The news provider's application server may render the content as a web page with associated links using templates. Although the end user may see a well-presented page with the relevant information, for a crawler-type search engine to extract the content of the HTML page it must be programmed to use information about the structure of the page and "scrape" the content and headline from the page. It may then store this content or a processed version for indexing purposes in its own database, and retrieve the link and story when a query matching the story is submitted. This search process is inherently inefficient and prone to errors. In addition it gives the content provider no control over the format of the article or the decision about which article to show in response to a query.

It would be desirable for search mechanism of the web to perform "deep searches" and "wide searches." "Deep search" may find information embedded in large databases such as product databases (e.g. Amazon.com) or news article databases (e.g. CNN). "Wide searches" may reach a large distribution. Moreover, it would be desirable for the search mechanism to efficiently use bandwidth and maximize search speed while avoiding bottlenecks. It would also be desirable for a search mechanism to function over an expanded web covering a wide array of distributed devices (e.g. PCs, handheld devices, PDAs, cell phones, etc.).

SUMMARY OF THE INVENTION

A distributed network search mechanism is described for a consumer coupled to a network to send a search request to and receive a search result from at least one provider coupled to the network in response to its search request. A search request may include a search query. A search result may include a query result. A search request and a search result may be formatted according to a query routing protocol (QRP). A QRP may specify a mark-up language format for communicating search requests, search results, and/or other information between nodes in the network.

A network hub may be configured to implement a search method according to a query routing protocol. The search method may include receiving a search request from a consumer. A network hub may accept search requests only from registered consumers. A network hub may be configured to receive registration requests from consumers. A network hub may be configured to receive registration requests from providers. A registration request may be formatted according to a QRP. A provider's registration request may indicate at least some of the search queries the provider is interested in receiving. The search method may include resolving a consumer's search query from a search request by determining at least one provider that indicated interest in receiving at least similar search queries in its registration request. A network hub may be configured to route a consumer's search query to a provider and may format the search query according to a QRP.

A provider may be configured to receive a search query. A provider may respond with a query result. A provider may be configured to customize its query result. A query result may be formatted according a QRP. The query result may be routed to a network hub. A network hub may be configured to receive a query result from a provider. A network hub may be configured to collate a plurality of query results regarding the same search query. A network hub may be configured to route a query result or collated query results to a consumer as a search result. A search result may be formatted according to a

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 illustrates a network utilizing the distributed information discovery platform according to one embodiment;

Figure 2 illustrates an architecture for the distributed information discovery platform according to one embodiment;

Figure 3 illustrates message flow in a distributed information discovery network according to one embodiment;

Figure 4 illustrates a provider with a query routing protocol interface according to one embodiment;

Figure 5 illustrates a provider with a query routing protocol interface and a results presentation mechanism according to one embodiment;

Figure 6 illustrates an exemplary distributed information discovery network including a plurality of hubs according to one embodiment;

Figure 7 illustrates provider registration in a distributed information discovery network according to one embodiment;

Figure 8 is a flowchart illustrating message flow in a distributed information discovery network according to one embodiment;